

**Crowley Road, Fuels Treatment and Noxious Weed Control Project
Environmental Assessment, OR-030-2003-07**

BLM OFFICE: Malheur Field Office

PROPOSED ACTION: Integrated prescribed burning, noxious weed control, and seeding treatment on multiple units near Harper, Oregon.

LOCATION OF PROPOSED ACTION: Locations are identified on map 1, and in whole or part of the following administrative units:

Harper Junction Pasture
North Racehorse Pasture
South Racehorse Pasture

CONFORMANCE WITH APPLICABLE LAND USE PLAN

This proposed action is subject to the following land use plans:

Northern Malheur MFP (1983)
Southern Malheur Rangeland Program Summary (RPS) (1984)
Proposed Southeastern Oregon Resource Management Plan/Final EIS (2001)

These plans have been reviewed to determine if the proposed action conforms with terms and conditions as required by 43 CFR 1610.5. The proposed action is in conformance with the above plans.

1.0 BACKGROUND

The areas identified for treatment in this assessment have gone through a variety of disturbances including historical heavy livestock use and repeated wildfire. Associated with the invasion of annual weed species such as cheatgrass, the fire return interval for this area has been shortened and the number and occurrence of fire has increased in the last 30-50 years.

Fire is a natural determinant of the sagebrush-steppe potential vegetation types. Historical fire patterns helped create mosaics of successional stages in both vascular plant and biological soil crust. More productive sites generally have fire-return intervals of less than 30 years (Burkhardt and Tisdale 1976; Arno and Gruell 1983; Fisher et al. 1987). Fifty to 100 years has often been cited as the average return interval in shrub-steppe regions (Wright et al. 1979; Peters and Bunting 1994). Failure to treat sites after fire can result in irreversible dominance by annual species (such as cheatgrass), which prevents the return of well-developed biological soil crust. With fire reoccurring at a shorter rate of return and on larger areas on cheatgrass infested ranges, the potential for undesirable annual plant invasion has increased. This has increased the potential for soil erosion, soil nutrient loss, and the loss of microbiotic crust.

Wildfires in recent years culminated in the year 2000, 2001 and 2002 with severe impacts to public and private land resources, especially to rural communities, across the West. For 2001

and subsequent years, the President asked for budget and actions to support recommendations to reduce impacts in the future. Congress, with the support of the Western Governors Association approved this plan, with Congress providing the needed increase in fire management budgets to begin to address the problems that were identified. The resulting plan is referred to as the National Fire Plan (NFP). The underlying strategy is called “Protecting People and Sustaining Resources in Fire-Adapted Ecosystems: A Cohesive Strategy.”

PURPOSE AND NEED

The Malheur Resource Area of the Vale District is applying the National Fire Plan strategy to:

- Improve the resilience and sustainability of rangelands at risk;
- Conserve watersheds, native species, and biodiversity;
- Reduce wildland fire costs, losses, and damages; and
- Improve assurances of public and firefighter safety.

The need for the proposed action is to convert and restore highly flammable, early seral annual rangeland to desirable perennial grass, forb and shrub rangeland. It is well known that cheatgrass ranges effectively out compete native vegetation when cover of these species has been reduced. Cheatgrass’s rapid growth and its ability to utilize most of the available upper soil moisture enables it to exclude seedlings of other species. It can dominate a site the second year after wildfire and can retain its position within the plant community for four to five decades (Daubenmire 1975) and indefinitely where associated burn frequency has truncated secondary succession.

The objectives of the proposed action would be to replace the existing annual vegetation and noxious weed species and restore adapted perennial vegetation. In addition, the establishment of perennial grasses, forbs and shrubs is expected to reduce wildland fire frequency and associated suppression costs and allow more natural ecological functions to occur.

Cheatgrass remains a hazard longer than that of perennial grasses because the plant dries four to six weeks earlier than perennials and is susceptible to fire one to two months longer in the Fall (Stewart and Hull 1949). In Oregon, cheatgrass ranges were found to be five hundred times more likely to burn than non cheatgrass ranges. Cheatgrass fires spread very rapidly and may extend into nearby stands of native vegetation and reduce the cover of native perennial grass, forb and shrub species.

Implementation of this project conforms with meeting Rangeland Health Standards in an area that is dominated by highly flammable annual species. The overall goal of providing a sustainable, healthy rangeland is consistent with meeting the National Fire Plan goals. The proposed action would improve vegetation diversity and ecological function and would provide more diverse and reliable forage for livestock and wildlife.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The proposed action is to conduct prescribed burns, mowing, herbicide applications and seeding treatments on the units identified on Map 1. Units, treatments, and acres expected to be treated are identified in Table 1. All sensitive plant locations and potential habitats would be avoided with the proposed treatments. The two sensitive plants (*Amsinckia carinata* and *Stanleya confertiflora*) present in the project area occur in very discreet habitats. *Stanleya confertiflora* occurs on brownish tan clay with few surface rocks and few other plants typically on lower slopes. *Amsinckia carinata* occurs on relatively steep yellowish talus slopes. These habitats would be identified, mapped, and avoided with the proposed treatments.

Units would be treated over a 1-5 year time period so that only a portion of the area will be treated in any one year. This will allow for variances in weather, funding and other management considerations including rest of treated areas from livestock grazing prior to and after treatment, if needed. In the event seeding treatments are not successful due to the lack of favorable precipitation, some units may require more than one treatment during this time period. The purpose of the burn, mowing, herbicide and seeding treatments would be to reduce the accumulation of annual plant material, control cheatgrass and other noxious annual weeds and to allow the establishment of perennial species. Areas identified within the treatment area on state or private lands would only be treated if approval is received and cooperative agreements are entered into with those landowners.

Prescribed Burning

Prescribed burns would be conducted during the fall to reduce the accumulation and seed source of undesirable species. Spring burning may be conducted where objectives could be met with that treatment. Fuel breaks for prescribed burns would be established around the proposed treatment perimeter including existing roads, and natural fuel breaks where feasible. Fuel breaks would consist of roads, disc or grader line and black lines that are between eight and twelve feet in width. Tumbleweeds may be burned to reduce fuel and weed accumulation at selected locations. Firefighter safety and preventing fire escapes would be the first priority. A complete burn (up to 100% fuel consumption) on some of the units in the proposed project area would be anticipated because of the highly flammable characteristics of cheatgrass due to its complete summer drying, fine structure and its tendency to accumulate litter (Tisdale and Hironaka 1981).

Mowing

Mowing and interseeding would be utilized within the proposed treated areas where burning is found to not be feasible and/or to tie treated areas together to make a continuous fuel break.

Herbicide treatment

It has been reported that high fire intensity alone will not kill all cheatgrass seed (Young 1976) and seed on or in mineral soil will survive even if most of the litter is consumed. Recent work by The Nature Conservancy (1997) and Prineville District BLM (1995) has shown that herbicide treatment enhances the establishment of desirable perennial species by reducing the seed bank and competition of annual weedy species. To control the annual noxious weed species, a herbicide treatment of glyphosate at 16-20 ounces per acres would be applied during the early spring using ground application. At this rate remnant desirable perennial vegetation is not expected to be killed. Herbicide treatment would be conducted in areas with a large component of annual noxious weed species. Unburned areas in the treatment area which contain understories dominated by annual noxious weed species may be treated with herbicide to control annual weeds and interseeded with adapted perennial grasses to enhance the understory. Glyphosate prevents the plant from producing amino acids that are the building blocks of plant proteins. A glyphosate Herbicide Information Profile is attached (Appendix 1).

If alternative, more effective or efficient application methods and herbicides which can meet objectives and constraints identified (i.e. not negatively impact desirable perennial vegetation) for this project are approved for use on public rangelands in Oregon, they may be substituted for ground application of glyphosate and used on this project site.

Vale District's five year Integrated Weed Control Program and Environmental Assessment No. OR-030-89-19, tiered to the Northwest Area Noxious Weed Control Program Environmental Impact Statement (December 1985) and Supplement (March 1987) addresses the environmental and human impacts, and provides the design features and guidance in applying herbicides on BLM administered lands within the Vale District.

Seeding

The fall following the burn, mow and/or spray treatment, treated areas would be seeded with a mixture of adapted perennial grasses, forbs and shrubs. Both native and nonnative seed mixes would be utilized. Native plants would be used to the extent possible in areas which retain remnant native herbaceous species and have the potential for reestablishment of native species with available plant material. Based on availability and site suitability, species may include the following: bluebunch wheatgrass, bottlebrush squirreltail, great basin wildrye, Lewis flax, western yarrow, scarlet globemallow, big sagebrush, four-wing saltbrush or other adapted natives. Nonnative plants will be used in areas that are more heavily infested with invasive species, in areas where suitable adapted natives are not available, and in areas to provide fuel breaks to reduce the size, spread and occurrence of wildfire and transitional areas adjacent to more intact shrub habitat. Species mixtures may include plants such as crested wheatgrass, great basin wildrye, bluegrass, bottlebrush squirreltail, four-wing saltbrush and big sagebrush. Depending upon individual species' seeding requirements, the seeding/planting would be done using a rangeland drill and/or broadcast application. Anticipated native and nonnative seed mix areas are identified on map 2. As more native plant material becomes available either

through release of new cultivars or collection and propagation of locally adapted species, these may be substituted and used on areas identified for seeding with nonnative mixes.

Following treatment, the area would be closed from livestock grazing for a minimum period of two growing seasons. If needed for livestock control, temporary fences (map 2) built to BLM specifications to allow for wildlife movement would be constructed.

Table 1

Unit	Treatments	Acres Treated
Harper Junction	Spray, Mow, Seed	400
North Racehorse	Burn/Mow, Spray, Seed	300
South Racehorse	Burn/Mow, Spray, Seed	200

2.2 Alternative A.(NO ACTION)

Under this alternative, the prescribed burns, herbicide treatments and seedings would not be conducted.

2.3 Alternative B. (Burn and Seed)

Under this alternative the area would be burned and seeded using the same procedures as outlined in the proposed action above. The herbicide treatments would not be used.

3.0 AFFECTED ENVIRONMENT

The areas identified for treatment in this assessment have gone through a variety of disturbance regimes including wildfire. Annual precipitation ranges from 8 to 12 inches, with the majority of accumulation in late winter and spring. Specific information about the resources of the area is included below:

3.1 Air Quality: Under criteria established through the Clean Air Act, as amended in 1990, the planning area has been designated as Class II, which means that no exceedance of the National Ambient Air Quality Standards has been monitored in the planning area.

3.2 Cultural and Paleontological Resources: The majority of information available on the prehistory of the northern Great Basin comes from data gathered from excavations at rockshelters like Fort Rock Cave, Roaring Springs Cave, Catlow Cave, and Dirty Shame Rockshelter. At Dirty Shame Rockshelter, the earliest dates of occupation come from charcoal sources dated to 9500 B.P. (Hanes 1988:40). The eruption of Mt. Mazama at 7050 years ago and resultant ash layer provides an excellent time marker for dating cultural habitation in the area. The postglacial warming and drying reached a peak between about 7000 and 4000 BP, and a moderate reversal of this trend established a climate roughly like that of the present after about 4000 BP (Aikens 1993). With

climatic changes, came a shift in floral and faunal species and the appearance of species that characterize arid environments. Overall, the prehistory of the northern Great Basin shows long continuity and adaptive change to distinctive ecosystems with a changing climate. The persistence of lithic and textile traditions and subsistence patterns during these chronological periods supports the theory of cultural continuity throughout the northern Great Basin. The subsistence pattern was based on a broad spectrum seasonal round that utilized over 50 floral species, big and small game hunting and fishing. Pre-European contact Native American hunters and gatherers living in southeast Oregon's high desert were extremely well adapted to their environment, and used it effectively and efficiently. There was considerable intermarriage between the Northern Paiute, who occupied the study area, and the Shoshoni and Nevada Paiute and some bands living east of the Snake River were designated as half Shoshone and half Paiute. Prior to European contact and the introduction of the horse, travel was by foot, probably with the aid of pack dogs. The Native people of the Great Basin, who practiced the ancestral lifeways into the 19th century were heirs to an extremely ancient cultural tradition with a technology both effective and efficient, with many multi-functional, light-weight and expendable tools.

From 1821-1846, contact between Native Americans and immigrants increased as the push westward continued. Exploration of new areas for furs, and overland migration routes during this time posed the first serious problems and formed the basis for more intensive settlement and development. After 1847, pressures on the indigenous peoples increased as the use of overland travel routes increased. White settlements appeared for the first time and mining rushes concentrated Euro-Americans in parts of the regions and the Mormons settled into the eastern Great Basin area. By the early 1860s, the tensions between Euro-Americans and Native Americans erupted into several prolonged conflicts.

It was during the 1880s, that settlers increasingly came to southeast Oregon, and small communities were established near reliable water sources. Most of them were in the northern part of the county and all did not survive. By 1884, sheep had become more profitable than cattle and were moved to market in the east along the same routes that brought settlers to the west. The coming of the railroad also brought a new method of moving livestock to the stockyards. Both cattle and sheep raising prospered during the 1890s. Sheep outfits tended to be small and numerous, while cattle operations were larger and fewer. The Taylor Grazing Act of 1934 along with the Great Depression led to an abrupt and permanent drop in the number of sheep, while fostering a long-term increase in the number of beef cattle, which has continued to the present.

Paleontological resources are defined as the fossilized remains of plants and animals. Fossils are of Pliocene, Miocene and Pleistocene age and are located in various volcanic tuff, sandstone/siltstone beds or Pleistocene gravels. Of particular interest are vertebrate fossils such as those of extinct camels, mammoths, mastodons, giant sloths, turtles and horses. Fossil localities have been reported on public lands within or adjacent to the project area.

3.3 Social Economic: Social and economic uses of the project area include, livestock grazing, recreation and wildlife habitat. The 900 acre treated area produces less than 100

Animal Unit Months (AUMs) of forage annually.

3.4 Soils and Water Resources: The soils found in the Crowley Road area were surveyed and described in Oregon's Long Range Requirements for Water 1969, Appendix I-10, Malheur River Drainage Basin. Average annual precipitation ranges from 8-12 inches and mean annual air temperature centers around 47 degrees F. The project area consists of five soil mapping units from this fourth-order soil survey. Areas proposed for treatment are flats and gently sloping areas (less than 10% slope) adjacent to the Crowley Road. Characteristics of the units are summarized below:

Classification Unit 1

Soils are deep, well drained, medium-textured soils derived from recent alluvium on nearly level fans and bottomlands. Soils occur usually at elevations of 2,500 to 4,700 feet and have a high potential for range seeding. The soil profile by depth consist of gray silt loam, brown silt loam, to stratified very fine sandy loam and silt loam with some fine gravel layers.

Classification Unit 3

Soils are shallow, silty, well drained underlain by gravel on nearly level recent fans and bottomlands. Soils occur usually at elevations of 3,000 to 4,500 feet and have a good potential for range seeding. The soil profile by depth consist of gray very fine sandy loam, to brown silt loam to brown loamy gravel. Depth to gravel substratum is usually 16 inches.

Classification Unit 55

Soils are shallow, loamy, well drained with cemented pans on very extensive to moderately steep old fans and high terrace remnants. Soils occur usually at elevations of 3,000 to 5,500 feet and have a good potential for range seeding. The soil profile by depth consist of brownish gray gravelly loam, to brown gravelly loam, to silica and lime cemented pan 6 to 20 inches thick over stratified loamy sand and gravel.

Classification Unit 60

Soils are moderately fine-textured, well drained soils on gently sloping to hilly uplands. Soils have good potential for range seeding.

Classification Unit 94

Unit 94 is a miscellaneous land unit consisting of gently sloping to moderately steep raw old lake sediments where active erosion has limited soil formation.

Due to the repeated disturbance that has occurred and the dominance of annual vegetative species, Microbiotic crusts are lacking on much of the treatment area.

3.5 Vegetation: Sagebrush-bunchgrass communities comprised the historic vegetation in the treatment area. The project area includes a diversity of plant habitats determined by geophysical processes, soil type, parent material, proximity to water, and disturbance regime. Plant communities occurring in the moist bottomlands near water drainages are dominated by *Artemisia tridentata* ssp. *tridentata* (basin big sagebrush), *Sarcobatus*

vermiculatus (greasewood), *Leymus cinereus* (basin wildrye), *Pseudoroegneria spicata* (bluebunch wheatgrass), and moist site forbs. Intact upland plant communities are comprised of the following shrub species: *Artemisia tridentata* ssp. *wyomingensis* (Wyoming big sagebrush), *Grayia spinosa* (spiny hopsage), *Tetradymia canescens* (horse brush), *Ericamerica nauseous* (grey rabbitbrush), *Ericamerica viscidiflora* (green rabbitbrush), *Purshia tridentata* (bitterbrush), and *Leptodactylon pungens* (prickly phlox). Common understory grass species include *Pseudoroegneria spicata* (blue bunch wheatgrass), *Achnatherum hymenoides* (Indian ricegrass), *Elymus elymoides* (bottlebrush squirreltail), and *Poa secunda* (Sandburg bluegrass). Native forbs present include *Allium* species (wild onion), *Cryptantha* species (white forget-me-not), *Phacelia hastata* (whiteleaf phacelia), *Phacelia lutea* (yellow phacelia), *Helianthus cusickii* (Cusick's sunflower), *Penstemon* species (beardtongue), *Chaenactis douglasii* (hoary false-yarrow), *Mentzelia albicaulis* (white-stemmed mentzelia), *Lewisia rediviva* (bitterroot), *Balsamorhiza sagittata* (arrowleaf balsamroot) and *Eriogonum* species (buckwheat).

Much of the native plant communities in the project area have been degraded and reduced in size by the abundance of nonnative weedy plant species. Common weedy plant species in the project area include *Bromus tectorum* (cheatgrass), *Hordeum jubatum* (foxtail), *Ranunculus testiculatus* (burr buttercup), *Onopordum acanthium* (Scotch thistle), *Salsola kali* (Russian thistle), and *Lepidium perfoliatum* (clasping pepperweed).

Special Status Plant Species

There are no federally listed threatened or endangered plant species known or suspected to occur in the project area. However, the project area contains unique habitats where special status plant species do occur. There are areas of brownish to tan clay loam soils with little vegetation cover where *Stanleya confertiflora* (Malheur prince's plume) occurs. *Stanleya confertiflora* is a bureau sensitive species with a global distribution of southeastern Oregon and southwestern Idaho (Geertson 1999). There are four documented occurrences of *Stanleya confertiflora* in or within close proximity to the proposed project area. The project area also includes talus slopes of welded yellow tuff where the narrow regional endemic *Amsinckia carinata* (Malheur fiddleneck) occurs. *Amsinckia carinata* is also a bureau sensitive species that occurs globally over a 20 square mile area west and south of Harper, Oregon (Meinke 1990). Portions of two of the five total global populations of *Amsinckia carinata* are within the proposed project area. Both *Stanleya confertiflora* and *Amsinckia carinata* are species of concern with the US Fish and Wildlife Service (USFWS) (Oregon NHP 2001). The USFWS is reviewing these species for consideration as candidates for listing under the Endangered Species Act. In addition, *Amsinckia carinata* is listed as threatened by the state of Oregon (Oregon NHP 2001). The project area also includes areas of grey colored clay soils derived from volcanic tuff that are depauperate of most vegetation where one large population of the endemic species *Chaenactis cusickii* (Cusick's Chaenactis) occurs. *Chaenactis cusickii* is a Bureau tracking species that occurs globally from southeastern Oregon to southwestern Idaho (Moseley 1994).

3.6 Wildlife

The key wildlife species for the project area are sagebrush obligate birds, mule deer and

pronghorn antelope. There are no federally listed or candidate species of wildlife that occupy the project area. As a result, there is no need to consult with the US Fish and Wildlife Service regarding Section 7 of the Endangered Species Act.

The project area currently does not have the desired diversity or shrub structure important to sagebrush obligate species. The area is primarily dominated by annual grass and forb species and is lacking the shrub cover and native understory important for local wildlife species and mule deer and pronghorn that winter in the area.

3.7 Riparian Zones/Fisheries: The only perennial stream in the project area is Cottonwood creek. No treatment will occur within the Cottonwood creek riparian area. Cottonwood creek contains several species of freshwater fish, but none are Threatened or Endangered.

4.0 ENVIRONMENTAL IMPACTS

This section describes the anticipated environmental consequences on the resources if the alternatives are implemented. The general effects of each alternative on resource categories is addressed. Direct effects are caused by an action and occur at the same time and place. Indirect effects are caused by an action and occur later in time or farther removed in distance. Cumulative effects are impacts produced by the action and might add to other past, present, and reasonably foreseeable future actions, and can take place over a period of time (40 CFR 1508.7 and 1508.8). Where appropriate, resource information also addresses time of impacts (duration), relation of the impacts to other resources (context), and severity (intensity), all of which are factors of significance.

4.1 Proposed Action

The effects on the human environment associated with the proposed herbicide treatment have been addressed in the District's Noxious Weed Control Program and Environmental Assessment. The potential impacts, mitigation measures and associated design features are described in the Environmental Assessment (EA-OR-030-89-19) and the Amended 1994 Decision Record. There would be no changes in the implementation of the programmatic EA in regards to the proposed action. Impacts described below would be spread over the expected 1-5 years it would take to fully implement the treatments.

4.11 Air Quality: Prescribed burning would increase the particulate matter and gasses in the atmosphere for the duration of the burn which could cause some short-term temporary reduction in visibility. An inversion or northerly winds could have minor impacts on Harper, Oregon, located just north of the project area and the only population center near the project area. The impacts would be minor, due to the fuel source being fine fuels of annual grasses. The spraying and seeding operation would not have a long-term effect on the quality of the air.

4.12 Cultural and Paleontological Resources: Prehistoric sites have been documented in this area through previous cultural resource surveys. Sites are located around water sources and were used primarily during the late spring through summer seasons during

hot weather. The majority of sites are lithic scatter sites and campsites that show occupation of an area through the presence of flakes, tools and lithic procurement. Prior to the burn operations a Class I file search and data review will be conducted to locate sites in the area of the burn. After burning and spraying but prior to seeding operations, a survey for Cultural Resources will be conducted at the Class II level. A Class II inventory is a stratified or statistically based survey designed to characterize the probable density, diversity and distribution of cultural properties in an area. Class II surveys would be used to demonstrate that the area sampled did not support human use to the degree that would make further inventory useful. A Class III inventory, designed to identify and record all cultural properties visible from the surface by using close-interval parallel transects may be conducted where significant resources are found or expected.

For fossil flora and faunal resources a Class I file search and data review will also be conducted to locate fossil flora and faunal resources that may be affected by the fire activity. If fossil are located within the area, surveys to access the nature and extent of the fossil locality will be conducted. If significant Paleontological or cultural resources are located they would be flagged and either avoided or recorded.

4.13 Social Economic: In the short term livestock grazing opportunities (less than 100 AUMs) would be reduced to implement the proposed action. Livestock use will be limited or excluded in each unit in the year treatment is initiated to allow sufficient fine fuels for burning. Following seeding, livestock will be excluded from the treated area for a minimum of two growing seasons to allow establishment of seeded species. In the long term, establishment of more diverse perennial vegetation would enhance forage quality for wildlife and livestock and provide a more stable forage base. Establishment of seeded perennial vegetation would decrease the size and intensity of wildfire in the long term which would decrease costs of suppression and decrease economic risks and costs to adjoining private property and structures from wildfire.

4.14 Soils and Water Resources: The loss of vegetation and vegetative matter in the surface horizon from the proposed treatments would subject the soils to enhanced wind and water erosion. Because this area receives limited precipitation, burning with insufficient soil moisture could cause the loss of some soil microorganisms and crusts, vegetative matter, soil nutrients and some remnant desirable grass and shrub species. The greatest impacts to soils are from the removal of vegetation and the resultant wind and water erosion. Impacts to the soil resources are expected to be the greatest after the first year of burning and the smallest from the second year after herbicide application. Moderate soil impacts would be expected during the drilling phase of the project. However, the effects are not expected to be significant because of minimal slopes and relatively low precipitation within the project area. In addition, wind and water erosion rates will decrease after the seedings become established. Using prescribed fire as a partial control measure for annual species would not cause great changes in surface soil physical and chemical properties because of the low fuel loading (1 hr fuels) and rapid rates of spread. The greatest effect would be the short term loss of soil productivity due to a temporary change in vegetative cover, surface organic matter and soil organisms in the upper few inches of the surface. Soil surface characteristics should return to prefire conditions within three growing seasons. The impact of rangeland drilling equipment

would loosen and displace the top two to three inches of the soil within the furrows which are twelve inches apart. This would be temporary, however, as the furrows act as moisture traps and the new plants would begin to stabilize the soil within the first year of drilling.

Depletion of soil nutrients and effects to the reestablishment of microbiotic crust formation from water erosion would be short-term until revegetation has occurred. The potential for wind erosion effects on crust and nutrients, once vegetation is reestablished, would also be reduced. In addition, water erosion in this area is low due to relatively flat to rolling terrain. Recovery of all types of microbiotic crust components is faster in fine-textured soils than in coarse-textured soils, as fine-textured soils are often stabilized by chemical and rain crusts and retain soil surface moisture longer (Johansen 1993). Recovery of some site's wind resistance is also more rapid in fine-textured soils, probably due to physical or rain crust formation after rainfall. Silty soils show a 50% recovery of wind resistance after a single large rain event. This physical or rain crust layer is often harder than the rest of the soil because compounds such as salts, lime, and silica are deposited at the surface as water evaporates, physical soil crusting reduces infiltration and increases water erosion from surface water flow.

Microbiotic crusts would not be affected by the proposed action and treatments except during the short-term disturbance from drilling seed into the soil surface. Over the long-term, because microbiotic crust expand very slowly over sites limited by moisture, the recovery rate of crusts that exist after fire and in some of the same areas that have burned over the last 30 years will be limited. Microbiotic crustal organisms are metabolically active only when wet; thus, recovery is faster in regions and microsites with greater effective precipitation (Johansen et al. 1993). Crusts on north and east slopes, as well as at higher elevations, will recover more quickly than crusts on south and west slopes and at lower elevations.

Herbicide studies on microbiotic crust have shown that crustal species are differentially affected, depending on the compound and the species tested (Metting 1981). Direct application of two glyphosate herbicides (Roundup and Accord) on moss-dominated biological soil crust had no short-term negative impact on bryophyte cover. In fact, bryophyte cover decreased significantly in control plots due to litter buildup from exotic annual grasses that had invaded the site. There is little information on the effects of repeated application or long-term effects of glyphosate and other herbicides on crustal species (Youtie et al. 1999).

Water quantity in the form of overland flow is expected to slightly increase over the short-term (one-three years) until vegetation in burned and herbicide applied treatment areas recover and provide interception and cover protection from high-intensity thunderstorms. Once regrowth of vegetation occurs in these areas overland flows would decrease from increased vegetative litter and infiltration of water into the soil profile thereby the possibility of sediment transport to streams would be reduced. Because of the low precipitation of the area, the relatively short half-life of the herbicide that will be applied, and low potential for runoff, soil and water resources should not be affected by the application of the proposed herbicide.

4.15 Vegetation: The moderate to low severity fires are not expected to substantially damage remnant perennial grasses in the area. The fire would reduce the accumulation of litter and seed stores of annual species and allow more efficient application of herbicides. Herbicide treatment would further suppress the production and seed bank of annual weed species and increase the probability of successful establishment of seeded species and at the proposed application rates would not kill remnant perennial grass and shrub species. A short-term loss of cover and forage could result from the treatments; however, in the long-term, habitat quality and quantity should increase with the increase in perennial forbs, shrubs and grasses. Successful establishment of seeded perennial vegetation would decrease the size, intensity and frequency of wildfire in the project area in the long term as well as provide control of and prevent reinvasion by annual noxious weed species. Diversity, resilience, and sustainability of treated range lands would be enhanced.

Replacing nonnative annual species with a mixture of nonnative perennial species would allow control of noxious weed species while enhancing and emulating more natural ecological functioning of those sites and allow for higher probability of successful future conversion to native perennial species if adapted plant materials become available. Successful establishment of more fire resistant perennial species would break up fuel continuity and help reduce the size of wildfire. Establishment of seeded perennial species is reversible and would not be a irretrievable or irreversible commitment of resources.

The proposed treatments should have no direct effects on special status plants because those sites or habitat would not be treated. The proposed project may have indirect beneficial effects on special status plant species in the project area. The reduction of noxious weeds in the project area could reduce competition for limiting resources between special status plants and noxious weeds. Noxious weeds can outcompete native plants for available resources (Olsen 1999), thus reducing the available habitats for special status plants to expand their range. The proposed reduction of cheatgrass in the project area could benefit special status plants by reducing fire frequency and intensity. Cheatgrass infestations can increase fire frequency and intensity (Mosley et al. 1999). The project's proposed conversion of annual weed communities to native rangelands could also have positive cumulative impacts on special status plants.

4.16 Wildlife: The impact to wildlife would primarily be a result of habitat modification. However, the habitat modification would be conducted over a 1-5 year period of time, and would not result in a significant loss of shrub cover due to the fact the project area is currently lacking shrub cover over a large portion of the area. If treatments are successful the existing shrub cover adjacent to the project area would be less likely to be destroyed by a large, high intensity wildfire.

Over the 1-5 year project period, wildlife populations should not be negatively impacted due to low population numbers and species diversity supported by the existing community. The areas adjacent to the project area would continue to provide important shrub cover and a perennial grass understory for wildlife use.

The establishment of perennial species and native shrubs would help prevent the spread of annual grasses into the understory of the adjoining lands, and ultimately, would help prevent the conversion of perennial shrubland to annual grasslands. Perennial species would aid in protecting the remaining native shrub habitat that is critical to sagebrush obligate species. By establishing native shrubs in the project area, the proposed action would also improve the habitat connectivity of the area, which is critical for wildlife movement.

Prescribed burns would be conducted primarily in the fall to reduce the mortality of wildlife species. The proposed herbicide is slightly toxic to wild birds and would be applied during early spring before nesting season (April) or fall (after August 1) to help reduce the impacts to wildlife.

In the long term, the proposed action would benefit wildlife by providing structural diversity and improved forage conditions and reducing habitat loss to large wildfires. The establishment of perennial species and native shrubs would improve the suitability of the project area for sagebrush obligate species.

4.20 Alternative A.(NO ACTION)

4.21 Air Quality: The short term air quality impacts identified in the proposed action would not occur. In the long term air quality may be impacted during and after large scale wildfires which would have good probability of occurring with no action.

4.22 Cultural and Paleontological Resources: There would be no impacts to cultural or paleontological resources as a result of this alternative

4.23 Social Economic: Rangeland productivity on the sites has declined to the degree that no action is uneconomical over the long-term. Little or any potential for site improvement is possible with no action. The potential for recurring wildland fires would continue to exist throughout the project area with associated displacement and loss of recreation, livestock grazing and wildlife use.

4.24 Soils: The short term negative impacts and long term positive impacts identified in the proposed action would not occur. The potential for additional soil erosion and negative impacts is likely with the potential for recurring wildfire which would continue to exist.

4.25 Vegetation: The vegetation condition of the area would continue to be the same as the present. Cheatgrass and other weedy annual species would continue to increase and occupy the site and provide a seed source into surrounding areas. The no action alternative should have no direct effects on any special status plant species. The no action alternative may have adverse indirect effects on special status plant species in the project area. The continued proliferation of noxious weeds in the project area could reduce the available potential habitats for special status plant species. Noxious weeds can displace native plants by being allelopathic, initiating growth before native plants, and noxious weeds may exploit the entire soil profile for water and nutrients (Olson 1999).

The no action alternative may have adverse cumulative effects on special status plants by allowing the continued spread of noxious weeds in the project area. Cheatgrass infestations can decrease the fire return interval and increase fire intensities (Mosley et al. 1999). Increased fire intensity and frequency can remove and exclude native plants from cheatgrass infested rangelands (Mosley et al. 1999). Thus, the cumulative impacts of the no action alternative could reduce the available habitats for special status plants in the project area by increased spread of cheatgrass and its concomitant increased fire frequency.

4.26 Wildlife: There would be little potential for habitat improvement with the no action alternative. Wildlife species diversity within the project area would be expected to remain low as a result of the lack of structure and plant diversity. There would continue to be a high potential for further degradation of currently suitable habitat in adjacent areas. Sagebrush habitat loss would continue with the expansion of exotic annual grasses and the frequent fires that are characteristic of cheatgrass dominated sites.

4.30 Alternative B. Burn and Seeding

4.31 Air Quality: Prescribed burning would increase the particulate matter and gasses in the atmosphere for the duration of the burn which could cause some short-term temporary reduction in visibility. An inversion or northerly winds could have minor impacts on Harper, Oregon located just north of the project area and the only population center near the project area. The impacts would be minor, due to the fuel source mostly being fine fuels composed of annual grasses.

4.32 Cultural and Paleontological Resources: The methodology for locating prehistoric and historic cultural resources under this alternative would be the same as under the Proposed Action alternative.

4.33 Social Economic: Impacts due to prescribed fire and seeding would be the same as described in the proposed action. Impacts due to herbicide application would not occur. Without the herbicide treatment, seeding results may be somewhat diminished as compared to the proposed action due to more competition from the annual species seedbank.

4.34 Soils: Impacts due to prescribed fire and seeding would be the same as described in the proposed action. Impacts due to herbicide application would not occur. Positive impacts to soils associated with success of seeded species may be less than under the proposed action due to more competition from annual species without the herbicide treatment.

4.35 Vegetation: Impacts due to prescribed fire, mowing and seeding would be the same as described in the proposed action. Impacts due to herbicide application would not occur. Positive impacts to vegetation associated with success of seeded species may be less than under the proposed action due to more competition from annual species without the herbicide treatment.

4.36 Wildlife: Impacts due to prescribed fire and seeding would be the same as described in the proposed action. Impacts due to herbicide application would not occur. Positive impacts to wildlife associated with success of seeded species may be less than under the proposed action due to more competition from annual species without the herbicide treatment.

4.40 Critical elements: The following resources were all considered in preparation of this assessment, but are either not present or no impacts are expected:

CRITICAL ELEMENTS

Farmlands, Prime/Unique
Floodplains
Native American Religious Concerns
T&E Species
Wastes, Hazardous/Solid
Water Quality
Wetland/Riparian Areas
Energy and Mineral Development
ACECs
Wild & Scenic Rivers
Wilderness
Environmental Justice

5.0 DESCRIPTION OF MITIGATION MEASURES AND RESIDUAL IMPACTS

To ensure firefighter safety, prescribed burn plan prescriptions and fireline safety procedures will be strictly followed at all times.

The design features and mitigation measures for herbicide application as described in the E.A. (OR-030-89-19 as amended in 1994) titled “The Vale District’s five Year Noxious Weed Control Program” will be strictly followed. All herbicides will be applied in accordance with EPA label requirements.

Livestock will not be allowed to graze the seedlings for a minimum of two growing seasons. Livestock trailing adjacent to Crowley Road, within the protected area(s), would be held to criteria of active management with riders or alternative trailing would be utilized.

Temporary fencing built to protect treated areas will be flagged and built to BLM specifications to allow for wildlife movement.

The two special status plants (*Amsinckia carinata* and *Stanleya confertiflora*) present in the project area occur in very discreet habitats. *Stanleya confertiflora* occurs typically on lower slopes on brownish tan clay with few surface rocks and few other plants. *Amsinckia carinata* occurs on relatively steep, yellowish talus slopes. These habitats would be identified, mapped, flagged and avoided with the proposed treatments. Seeded

areas that are within 100 feet of special status plant habitat buffers would be seeded with a mix of native plant species to reduce the potential for seeded exotics to outcompete and replace special status plants on these sites. Herbicide treatments would be limited to 100 feet away from the special status plant habitats to avoid the possibility of herbicide drift. Mechanical seeding would avoid these areas with a 100-foot buffer as well, to avoid any disruption of the site. Herbicides would only be applied during times of calm winds to further limit any possibility of drifting herbicide affecting the special status plants present. The project inspector would be on site while areas around the flagged special status plant habitats are being treated to assure that herbicide spraying occurs only when risks of drift are minimal, and to assure that special status plant habitats are avoided.

6.0 PERSONS/AGENCIES CONSULTED

Oregon Department of Fish and Wildlife
Oregon Department of Lands
Adjacent Private Land owners
Identified Interested Publics and Livestock Permittees in associated allotments
Malheur County Court
Burns-Paiute Tribe

7.0 PARTICIPATING STAFF

Steve Christensen - Rangeland Management Specialist
Diane Pritchard - Archeologist
Al Bammann - Wildlife Biologist
Joe-Riley Epps - Fuels Specialist
Garth Ross - Fish Biologist
Shaney Rockefeller - Hydrology/Soils
Jean Findley – Botanist
Roger Ferriel - Botanist
Tracy Skerjanec - Assistant Fire Management Officer
Lynne Silva - Weed Coordinator
Brian Watts – Fire Ecologist
Randy Eyre – Planning Coordinator
Tom Dabbs – Malheur Field Office Manager

FINDING OF NO SIGNIFICANT IMPACTS

The Malheur Resource Area of the Bureau of Land Management (BLM) Vale District has analyzed a proposal for the Crowley Fuels Treatment and Noxious Weed Control Project. The proposed project sets forth land treatment activities designed to reduce fuel loadings, improve rangeland health, control noxious weeds and reduce the risk of wildfire while protecting and enhancing other resource values. The attached Environmental Assessment (EA 030-2003-07) contains a detailed description and analysis of two action alternatives and a no action alternative. This EA was prepared under the guidance provided by the Northern Malheur Management Framework Plan and Rangeland Program Summary and the Proposed Southeastern Oregon Resource Management Plan and Final EIS. The

proposed action would take highly flammable, mostly exotic annual rangeland and convert it to less flammable perennial plant species, enhancing resource values while reducing fire frequency. These are positive impacts to the overall human environment with few, if any, negative impacts. In relation to context, the project's affected region is localized and the effects of implementation are limited to the area affected by the project. This is particularly true in light of the mitigation measures adopted into the project specifications. In relation to intensity or severity, mitigation measures have been designed to protect public health and safety. Further, no unique characteristics are involved, there are no highly uncertain, unique or unknown risks, and the project does not set a precedent for future actions that could have significant effects. The action also does not appear to be related to any other action that could be significant, there will be no impacts to sites that could be listed on the National Register of Historic Places, no scientific, cultural or historic resources will be lost, and there will be no violation of any law or requirement protecting the environment. There will be no impacts to any species listed under the Endangered Species Act. There will be no irretrievable or irreversible commitment of resources as a result of the proposed action. I have determined, based upon the analysis of environmental impacts contained in the referenced EA, and what is written above, that the potential impacts raised by the proposed project will not be significant and that preparation of an environmental impact statement is not required.

s/Bob Alward, Acting Malheur Field Manager

March 12, 2003

Authorized Official

Date

Decision Record

Crowley Road, Fuels Treatment and Noxious Weed Control Project Environmental Assessment, OR-030-2003-07 Malheur Resource Area, Vale District Bureau of Land Management

This Decision Record documents my decision to select the proposed action for implementation of the Crowley Road, Fuels Treatment and Noxious Weed Control Project. This alternative was analyzed in the attached Environmental Assessment (EA), OR-030-2003-07. The EA is in conformance with the Northern Malheur Management Framework Plan and the Proposed Southeastern Oregon Resource Management Plan and Final EIS.

Public Review

Subsequent to the preparation of the EA, the publishing of a Legal Notice setting forth the EA's availability for public comment, posting to the Vale District internet site, notification of identified interested publics, and notification of affected permittees, no comments were received.

Decision

My decision to select the proposed action is based upon the interdisciplinary analysis contained in EA OR-030-2003-07 as well as the supporting record and field review.

All mitigation measures, design features and monitoring processes described in the EA are incorporated into project implementation plans. Among these are:

To ensure firefighter safety, prescribed burn plan prescriptions and fireline safety procedures will be strictly followed at all times.

The design features and mitigation measures for herbicide application as described in the E.A. (OR-030-89-19 as amended in 1994) titled "The Vale District's five Year Noxious Weed Control Program" will be strictly followed. All herbicides will be applied in accordance with EPA label requirements.

Livestock will not be allowed to graze the seedings for two years or the amount of time required to allow the seeding(s) to become established.

Temporary fencing built to protect treated areas will be flagged and built to BLM specifications to allow for wildlife movement.

Monitoring pretreatment and post treatment will be done within the project area to assess success of meeting treatment objectives, preventing unintended impacts and determining if continued or repeat treatment will be necessary.

Decision Rationale

The proposed project sets forth land treatment activities designed to reduce fuel loadings, improve rangeland health, control noxious weeds and reduce the risk of wildfire while protecting and enhancing other resource values. These are positive impacts to the overall human environment with few, if any, negative impacts. In relation to context, the project's affected region is localized and the effects of implementation are limited to the area affected by the project. This is particularly true in light of the mitigation measures adopted into the project specifications. In relation to intensity or severity, mitigation measures have been promulgated to protect public health and safety. Further, no unique characteristics are involved, there are no highly uncertain, unique or unknown risks, and the project does not set a precedent for future actions that could have significant effects. The action also does not appear to be related to any other action that could be significant, there will be no impacts to sites that could be listed on the National Register of Historic Places, no scientific, cultural or historic resources will be lost, and there will be no violation of any law or requirement protecting the environment. There will be no impacts to any species listed under the Endangered Species Act. There will be no irretrievable or irreversible commitment of resources as a result of the proposed action.

The proposed project will have no effect on Prime/Unique Farmlands, Floodplains, Native American Religious Concerns, T&E Species, Hazardous or Solid Wastes, Water Quality, Wetlands, Riparian Zones, Energy and Mineral Development, Areas of Critical Environmental Concern, Wild and Scenic Rivers, Wilderness or Environmental Justice. This plan meets none of the criteria for significance.

s/Tom Dabbs, Malheur Field Manager

March 31, 2003

Authorized Official

Date

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Appendix1

Extension Toxicology Network Glyphosate Information Profile

A Pesticide Information Project of Cooperative Extension Offices of Cornell University, Oregon State University, the University of Idaho, and the University of California at Davis and the Institute for Environmental Toxicology, Michigan State University. Major support and funding was provided by the USDA/Extension Service/National Agricultural Pesticide Impact Assessment Program.

EXTOXNET primary files maintained and archived at Oregon State University

Revised June 1996

Glyphosate

Trade and Other Names: Trade names for products containing glyphosate include Gallup, Landmaster, Pondmaster, Ranger, Roundup, Rodeo, and Touchdown. It may be used in formulations with other herbicides.

Regulatory Status: Glyphosate acid and its salts are moderately toxic compounds in EPA toxicity class II. Labels for products containing these compounds must bear the Signal Word WARNING. Glyphosate is a General Use Pesticide (GUP).

Chemical Class: Not Available

Introduction: Glyphosate is a broad-spectrum, nonselective systemic herbicide used for control of annual and perennial plants including grasses, sedges, broad-leaved weeds, and woody plants. It can be used on non-cropland as well as on a great variety of crops. Glyphosate itself is an acid, but it is commonly used in salt form, most commonly the isopropylamine salt. It may also be available in acidic or trimethylsulfonium salt forms. It is generally distributed as water-soluble concentrates and powders. The information presented here refers to the technical grade of the acid form of glyphosate, unless otherwise noted.

Formulation: Glyphosate itself is an acid, but it is commonly used in salt form, most commonly the isopropylamine salt. It may also be available in acidic or trimethylsulfonium salt forms. It is generally distributed as water-soluble concentrates and powders.

Toxicological Effects:

- **Acute toxicity:** Glyphosate is practically nontoxic by ingestion, with a reported acute oral LD50 of 5600 mg/kg in the rat. The toxicities of the technical acid (glyphosate) and the formulated product (Roundup) are nearly the same. The oral LD50 for the trimethylsulfonium salt is reported to be approximately 750 mg/kg in rats, which indicates moderate toxicity. Formulations may show moderate toxicity as well (LD50 values between 1000 mg/kg and 5000 mg/kg). Oral LD50 values for glyphosate are greater than 10,000 mg/kg in mice, rabbits, and goats. It is practically nontoxic by skin exposure, with reported dermal LD50 values of greater than 5000 mg/kg for the acid and isopropylamine salt. The trimethylsulfonium salt has a reported dermal LD50 of greater than 2000 mg/kg. It is reportedly not irritating to the skin of rabbits, and does not induce skin sensitization in guinea pigs. It does cause eye irritation in rabbits. Some formulations may cause much more extreme irritation of the skin or eyes. In a number of human volunteers, patch tests produced no visible skin changes or sensitization. The reported 4-hour rat inhalation LC50 values for the technical acid and salts were 5 to 12

mg/L, indicating moderate toxicity via this route. Some formulations may show high acute inhalation toxicity. While it does contain a phosphatyl functional group, it is not structurally similar to organophosphate pesticides which contain organophosphate esters, and it does not significantly inhibit cholinesterase activity.

- **Chronic toxicity:** Studies of glyphosate lasting up to 2 years, have been conducted with rats, dogs, mice, and rabbits, and with few exceptions no effects were observed. For example, in a chronic feeding study with rats, no toxic effects were observed in rats given doses as high as 400 mg/kg/day. Also, no toxic effects were observed in a chronic feeding study with dogs fed up to 500 mg/kg/day, the highest dose tested.
- **Reproductive effects:** Laboratory studies show that glyphosate produces reproductive changes in test animals very rarely and then only at very high doses (over 150 mg/kg/day). It is unlikely that the compound would produce reproductive effects in humans.
- **Teratogenic effects:** In a teratology study with rabbits, no developmental toxicity was observed in the fetuses at the highest dose tested (350 mg/kg/day). Rats given doses up to 175 mg/kg/day on days 6 to 19 of pregnancy had offspring with no teratogenic effects, but other toxic effects were observed in both the mothers and the fetuses. No toxic effects to the fetuses occurred at 50 mg/kg/day. Glyphosate does not appear to be teratogenic.
- **Mutagenic effects:** Glyphosate mutagenicity and genotoxicity assays have been negative [58]. These included the Ames test, other bacterial assays, and the Chinese Hamster Ovary (CHO) cell culture, rat bone marrow cell culture, and mouse dominant lethal assays. It appears that glyphosate is not mutagenic.
- **Carcinogenic effects:** Rats given oral doses of up to 400 mg/kg/day did not show any signs of cancer, nor did dogs given oral doses of up to 500 mg/kg/day or mice fed glyphosate at doses of up to 4500 mg/kg/day. It appears that glyphosate is not carcinogenic.
- **Organ toxicity:** Some microscopic liver and kidney changes, but no observable differences in function or toxic effects, have been seen after lifetime administration of glyphosate to test animals.
- **Fate in humans and animals:** Glyphosate is poorly absorbed from the digestive tract and is largely excreted unchanged by mammals. At 10 days after treatment, there were only minute amounts in the tissues of rats fed glyphosate for 3 weeks. Cows, chickens, and pigs fed small amounts of glyphosate had undetectable levels (less than 0.05 ppm) in muscle tissue and fat. Levels in milk and eggs were also undetectable (less than 0.025 ppm). Glyphosate has no significant potential to accumulate in animal tissue.

Ecological Effects:

- **Effects on birds:** Glyphosate is slightly toxic to wild birds. The dietary LC50 in both mallards and bobwhite quail is greater than 4500 ppm.

- **Effects on aquatic organisms:** Technical glyphosate acid is practically nontoxic to fish and may be slightly toxic to aquatic invertebrates. The 96-hour LC50 is 120 mg/L in bluegill sunfish, 168 mg/L in harlequin, and 86 mg/L in rainbow trout. The reported 96-hour LC50 values for other aquatic species include greater than 10 mg/L in Atlantic oysters, 934 mg/L in fiddler crab, and 281 mg/L in shrimp. The 48-hour LC50 for glyphosate in *Daphnia* (water flea), an important food source for freshwater fish, is 780 mg/L. Some formulations may be more toxic to fish and aquatic species due to differences in toxicity between the salts and the parent acid or to surfactants used in the formulation. There is a very low potential for the compound to build up in the tissues of aquatic invertebrates or other aquatic organisms.
- **Effects on other organisms:** Glyphosate is nontoxic to honeybees. Its oral and dermal LD50 is greater than 0.1 mg/ bee. The reported contact LC50 values for earthworms in soil are greater than 5000 ppm for both the glyphosate trimethylsulfonium salt and Roundup.

Environmental Fate:

- **Breakdown in soil and groundwater:** Glyphosate is moderately persistent in soil, with an estimated average half-life of 47 days. Reported field half-lives range from 1 to 174 days. It is strongly adsorbed to most soils, even those with lower organic and clay content. Thus, even though it is highly soluble in water, field and laboratory studies show it does not leach appreciably, and has low potential for runoff (except as adsorbed to colloidal matter). One estimate indicated that less than 2% of the applied chemical is lost to runoff. Microbes are primarily responsible for the breakdown of the product, and volatilization or photodegradation losses will be negligible.
- **Breakdown in water:** In water, glyphosate is strongly adsorbed to suspended organic and mineral matter and is broken down primarily by microorganisms. Its half-life in pond water ranges from 12 days to 10 weeks.
- **Breakdown in vegetation:** Glyphosate may be translocated throughout the plant, including to the roots. It is extensively metabolized by some plants, while remaining intact in others.

Physical Properties:

- **Appearance:** Glyphosate is a colorless crystal at room temperature.
- **Chemical Name:** N-(phosphonomethyl) glycine
- **CAS Number:** 1071-83-6
- **Molecular Weight:** 169.08
- **Water Solubility:** 12,000 mg/L @ 25 C
- **Solubility in Other Solvents:** is. in common organics (e.g., acetone, ethanol, and xylene)
- **Melting Point:** 200 C
- **Vapor Pressure:** negligible
- **Partition Coefficient:** -3.2218 - -2.7696
- **Adsorption Coefficient:** 24,000 (estimated)

Exposure Guidelines:

- **ADI:** 0.3 mg/kg/day
- **MCL:** Not Available
- **RfD:** 0.1 mg/kg/day
- **PEL:** Not Available
- **HA:** 0.7 mg/L (lifetime)
- **TLV:** Not Available

DISCLAIMER: The information in this profile does not in any way replace or supersede the information on the pesticide product labeling or other regulatory requirements. Please refer to the pesticide product labeling.

